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§ 297. **A New Hawaiian Fern.—*Hymenophyllum Baldwinii*.**

—Subspithamæum : frondibus lanceolatis vel ovato-lanceolatis læte viridibus tenerrimis bi-tripinnatifidis; pinnis primariis oblique-divergentibus plerumque rachi anguste alatae adnatis inferioribus solutis; pinnulis simplicibus vel in segmentis paucis oblongis obtusis emarginatisve margine integerrimis nudis divisis; segmentis infimis cujusdam pinnulæ abbreviatis apice soriferis; involucris subrotundis fere ad basin usque brevem alatum bilobis, lobis integerrimis, receptaculo columnari; stipite brevi rachique basin versus pilis rufis subulatis hispidis.

Abundant in a little valley in Oahu, at 2,500 feet above the sea; Hon. D. D. Baldwin, 1878. The rhizoma may be elongated and creeping, but having seen only the ends of rhizomes bearing half a dozen clustered fronds, I am unable to say whether it is long or short. The fronds are from three to six inches long, the shorter ones lanceolate and bi-pinnatifid, the larger ones ovate-lanceolate and tri-pinnatifid. The very short and hirsute or hispid stalks, and the shorter and more delicately membranaceous segments will easily distinguish it from *H. recurvum*. *H. scabrum*, of New Zealand, is a larger and coarser plant, and has the hairs of the stalk heavier and composed of very short articulations, while in *H. Baldwinii* the hairs have very long joints, and taper from a slightly swollen base to a long and very delicate point. I take pleasure in naming it for a gentleman who has shown great interest in the cryptogamic vegetation of the Hawaiian Islands.

Mr. Baldwin has also sent specimens of *Trichomanes pyxidiferum*, Linn., a species which is, I believe, new to the Hawaiian Islands. He reports that it is abundant in certain localities in Maui. **D.C.F.**

§ 298. **A few notes on the abnormal absence of color in plants.**—In the few observations which follow, it is not expected that anything new will be found; the object is more to call attention to a few facts which seems to have been generally passed over in botanical researches as devoid of interest. The whole subject arranges itself under two heads. The first will comprise true "albinos," or such plants as have spontaneously, in a state of nature, lost their colors and become white flowered. The second relates to those plants in which the colors have been more or less eliminated by artificial means.

First then, we have to consider those "sports" of nature where there has been a sudden change, without any intermediate steps, from a plant with colored flowers to a pure white variety; which change, for want of a better term, we call "spontaneous." Such may be aptly termed "negative" varieties, since their peculiarity is due rather to an *absence* of their normal color, than to the *presence* of white.

It is nothing uncommon to see, in many species, a gradual change from a brightly colored individual, through successive lighter and lighter ones, until a pure white is reached. This may be seen very well in *Hepatica triloba*, which comprises individuals

of every shade of color from dark purple to white; or in *Polygala sanguinea*, in which we find the same gradual change from a dark red. But such cases do not concern us, as it is often difficult to determine which is normal with them, color or the absence of it.

The following list of "albino" plants is made from specimens collected during the last three years.

Vernonia noveboracensis; Willd; Richmond, S. I., 1876.

Lappa officinalis, var **major**; not uncommon.

Lobelia syphilitica, L.; in a limited locality, near Clove Lake, S. I., can be found every year and seems in a fair way to perpetuate itself.

Epiphegus virginiana, Bart.; a small clump near Four Corners, S. I., always comes up in the same spot each season.

Verbena hastata, L.; Gifford's, S. I., 1877.

Asclepias incarnata, L.; generally produces a few white flowered plants each year in the Clove Lake Swamp, S. I.

Trifolium pratense, L.; occurs rarely.

Brunella vulgaris, L.; A few scattered specimens may generally be obtained every year on S. I.

Both *Gentiana crinita*, Froel, and *Lobelia cardinalis*, L., have been reported to me as having produced at times albino forms, but I have never seen them personally. I have not included in this list *Verbascum Blattaria*, L., as in some localities I have found the white variety almost as plentiful as the yellow. All the others mentioned, however, may be considered as true "albinos" and from them we may learn some curious facts, and open an interesting field of study.

Now, in the first place, not only does the flower show the characteristic absence of color, but the leaves, stem, and, in fact, the entire plant, are invariably of a lighter green; and if any red or purple color should be normal to the stem (which is often the case) this also is of a lighter shade. Thus even the superficial appearance of the plant will strike the observer at once. Secondly, if we have under consideration a plant which commonly is known to have juice of an acrid or peculiar taste, this is generally more or less absent in the albino form, and sometimes is eliminated entirely. Darwin has noted this fact, and, in commenting upon it, says that honey bees evidently are aware of it, for they perforate the calyx and corolla of the white *Aconitum Napellus*, to get at the nectaries, but will not do so with the colored ones. For this reason, perhaps, we bleach celery and rhubarb to get rid of their strong flavor: in both cases the loss of the strong taste is accompanied by the absence of color. It has often been urged that these albinos are mere "sports" of Nature, with nothing constant about them; their peculiarities due, often, to growing in the shade, &c. In fact, that it is a condition due to bleaching or insufficient sunlight, and that there is nothing of it inherent in the constitution of the plant. Fortunately I have been able to test this. In the case of *Lobelia syphilitica*, I first found the plants in the shade of some rather thick underbrush, in the month of September. This growth was cut down the following spring, and the place opened to the full glare of the sun. This was done three years ago, yet, every autumn since, these plants have either reappeared, or

else left offspring which have inherited their albino nature. This shows them not only constant in their peculiarities, but also that these are bred in the plant and capable of inheritance. *Epiphegus Virginiana* and *Brunella vulgaris* offer the same proofs. Nor has the influence of locality much or anything to do with it, for a plant of the *Lobelia syphilitica*, which originally grew in a swamp, was transplanted to a comparatively dry garden a mile or more away, yet came up and blossomed white the next year.

Let us now see what the experience gained in the cultivation of white varieties can tell us. Probably the Japanese have brought the art of eliminating color from plants to the greatest perfection. Scores of species and genera have been by them variegated in the most peculiar manner. But this is never constant in this country, but after a while always tends to revert to the primitive color again. The elimination of the green color from leaves has been sometimes carried to such an extent that no color is visible except a faint shade along the midribs. When this degree is reached it is fatal, and not only does the plant become unhealthy and generally die, but it is impossible to perpetuate its peculiarity either from seeds or cuttings. In the case of Geraniums with variegated white and green leaves, I have been told that it seems necessary for the green to be in the middle of the leaf and the white in the form of a band around it. In this case the variety can be propagated, but if the white should take possession of the middle, and crowd the green to the edge, it cannot be. It seems necessary for the green color to have possession of the midrib. The effect of an increase in light and heat is very marked, and florists have to be continually on the lookout, when a variety of any plant is obtained, that it does not revert back to its normal color. Carnations, which are perfectly white during the cool autumn and winter months, will frequently become red streaked in a greater or less degree, as soon as the sun has gained increased power of light and heat in the spring.

From these facts we may conclude that Nature resents all attempts at the elimination of color from plants, and that this elimination is at the expense of the vitality of the plant, to a greater or less degree, and depends upon the same laws that relate to albinos in the animal world, which are proverbially weaker than their colored kindred. Even in those albino plants which occur in a state of nature, the growth and vigor is conspicuously less than that of colored individuals immediately beside them, although the number of the former would perhaps exclude this as a fair comparison. As there seems to be no tendency to reversion in these natural albinos, they might perhaps be made permanent varieties and be valuable on that account. No doubt this permanence is due to the change being sudden, leaving no trace of color by intermediate steps, while in cultivated examples the white has generally been obtained by a gradual selection of less and less darkly colored ones, and hence there would be a greater tendency to reversion back through these steps again. Besides this, in a state of nature the organs of fructification are secure, and hence the plant may propagate from its seed, while artificial selection and cultivation is frequently at the expense

of these organs, and the perpetuation of the variety necessarily becomes dependent on cuttings, which frequently fail to grow into plants inheriting the peculiarity of the parent stock.

A chemical analysis of the ashes of albino plants would perhaps throw some light on the subject, by showing if the difference in color can be accounted for by a difference in the elements absorbed by the plants; but, even could this be shown, the question would still remain: "Why should an individual plant refuse, apparently to its own detriment, to absorb something that other plants of the same species find necessary?"

ARTHUR HOLLICK.

Read at the Meeting of the Torrey Bot. Club, Mch. 11th, 1879.

We find from *NATURE*, Nov. 28, 1878, that a paper was read on this subject by Prof. Church, before the London Chemical Society, in November last. The author had made numerous analyses of white and green leaves of the same age from the same plant, in order to discover whether any difference in their composition could be detected. The leaves were gathered from the maple, holly, ivy, and three exotic plants. White leaves contain more water than corresponding green leaves, whilst the ash of white leaves contains more potash and phosphoric acid, but less lime, especially less oxalate and carbonate of calcium. Nearly sixty per cent. of nitrogen in the white leaves is non-albumenoid, while the green leaves contain thirty per cent. of nitrogen in that state. The author also analyzed a vegetable parasite, the dodder, and its host, the red clover; he found that the white leaves resemble in composition the parasite, while the host represents the green leaves. The white leaf is therefore, in a sense, a parasite on the green leaf, and owes its existence to its connection with the normal portion of the plant.

W. R. G.

§ 299. **Botanical Notes.**—Dr. L. Rabenhorst has recently retired from the editorship of the *CRYPTOGAMIC JOURNAL*, *Hedwigia*, and is succeeded by the well known Mycologist, Dr. George Winter.—A new quarterly journal devoted to the interests of students of fungi has recently made its appearance. It is called the *Revue Mycologique*, and is edited by M. C. Roumequere, of Toulouse. The first number, which is very interesting, contains an article by the editor on the lichen theory of Schwendener which he condemns; another article treats of the culture of various species of Agarics in Japan; and these are succeeded by other articles both original and selected, and notices of new books.—From the beginning of the present year, Prof. A. de Bary assumes the sole editorship of the *Botanische Zeitung*.—To a recent number of the *Science News* Mr. John Robinson communicates an article entitled "The Botrychia not Ferns," in which he states that "It should be more generally known by collectors that *Ophioglossum* and *Botrychium* are not true ferns, and that they should be looked upon rather as fern-allies, for they differ from the *Filices* more than the *Equiseta*, and as much as most *Lycopodia*." As reasons for his conclusions, he cites the differences in the mode of vernation, the difference in the growth of the prothallus, which, in the *Ophioglossaceæ*, takes place under ground—the prothallus being very small, destitute of chlorophyll, and having but few root-hairs, while in the true ferns the case is exactly the reverse. There is a greater